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	Deaf and Dumb.	Blind.	Insane.	Idiotic.
Whites .....	1 in 2,073	1 in 2,455	1 in 1,295	1 in 1,384
Free Coloured .....	1 ,, 2,956	1 ,, 867	1 ,, 1,355	1 ,, 983
Slaves .....	1 ,, 6,552	1 ,, 2,646	1 ,, 11,011	1 ,, 3,081
Total Slaves and Free Coloured....	1 ,, 5,730	1 ,, 2,131	1 ,, 5,936	1 ,, 2,461

It will be perceived from this that blindness is more prevalent, and deafness and insanity less frequent, among the coloured races than among the white. The proportion of insane among the slaves is remarkably small. Perhaps the returns of the idiotic among the slaves are defective, as their large proportion among the free coloured seems to show that idiocy is more common among the coloured races than among the whites. In a large body of slaves, those only partially idiotic, or deaf and dumb, might be forgotten or overlooked by the master or overseer (who filled the schedule), being, in many cases, still useful hands, while the blind and insane would be more likely to be remembered.

It appears that the deaf and dumb and the blind are most numerous in those States from which the emigration is greatest (the Central and New England), and least in those States whose population receive accessions from immigration—showing that comparatively few of these two classes of persons are carried along with the stream of emigration. In California, Utah, and Oregon (omitted in the foregoing calculations on account of their recent settlement and peculiar circumstances), where the population consists almost wholly of recent immigrants, there are only 6 deaf and dumb, and 2 blind, in an aggregate population of 184,370. New Mexico is also omitted in these calculations, its population being of a peculiar character, chiefly a mixture of Spanish and native Indian races, with but few Anglo-Americans.

*On the Progress, Extent, and Value of Steamboat Building and Marine Engine Making on the Clyde.* By JOHN STRANG, LL.D.

[Read before the Statistical Section of the British Association, at Belfast, 7th September, 1852.]

OF the many sources of progress and prosperity which have characterised Scotland, and particularly its western districts, during the last fifty years, there is, perhaps, none more conspicuous than the business connected with the construction of steam vessels and marine engines. This industrial interest, unlike that of the manufacture of cotton, of silk, or of wool, deals chiefly with articles of home produce, and exerts its labour and intelligence on materials which, in their primary condition, are the products of our own soil, and manipulated by our own workmen. It is a species of manufacture, too, which necessarily requires greater skill,

and, consequently, higher remuneration, than are requisite for the more common manufactures of the country, and hence it has proved a source of great wealth to some, and of comparative comfort to all connected with it; while, at the same time, it has created for the districts wherein this branch of industry is located, a constant and remunerating employment for the more active, industrious, and intelligent class of the inhabitants.

The construction of steam vessels is, in comparison to other manufactures, a business of yesterday. It is at this moment just forty years since the tiny "Comet," the first *passenger steamboat* which ever sailed in Europe, made its trial trip from Glasgow to Greenock, amid the hopes of its sanguine projector, and the sneers of many a self-interested and sceptical *skipper*. It was a boat of only thirty tons burthen, and boasted an engine of three-horse power. Small, however, though the attempt was, it was enough to prove that the idea was a practical one, and a few years had not passed over before the steamboat became as much a necessity as any other human invention. Although the history of the steamboat is one of the most modern of our social discoveries, it is marked by many striking eras. In form, it was first limited to a wooden hull, a single engine and paddle-wheels; it now boasts hulls of iron, double engines, and screw propellers. In speed, it was, in the beginning, scarcely equal to that of the old lumbering stage-coach; at present it reaches fifteen to sixteen miles an hour, and with a regularity almost equal to a railway. At its outset, its operations were limited to the navigation of rivers and inland lakes; in a few years it cautiously extended itself along the coast, and for a considerable period it has successfully braved the ocean.

To whatever individual the honour may be justly assigned of having given the first idea of applying the steam engine to the propelling of boats or vessels, it cannot be denied that the first successful effort to render this idea practically available was made by Henry Bell, on the river Clyde; and it is satisfactory to think that the district in which the first successful essay was made has continued to be the great seat of the manufacture of marine engines and steam vessels. For the purpose of illustrating the progress, the extent, and the value of this most important branch of Scottish industry, let me attempt to place before you the result of the investigations which I have lately made in relation to this matter. And first, let us shortly advert to

#### *The Progress of Steamboat Building and Sailing on the Clyde.*

As I have already stated, it is just forty years since the first steamboat was built on the Clyde, and up to the present period all the steamers employed in the navigation of the river, its firth and estuaries, have been constructed either at Glasgow, Greenock, Port-Glasgow, or Dumbarton. Although for some years these river steamers were both limited in number and small in size, I find that in 1831 the number of steam vessels then regularly sailing from the Clyde amounted to 55, with an aggregate tonnage register measure of 4,905, while in 1835 the vessels had increased to 67, and the tonnage to 6,691. Since that period the steamboat traffic from Glasgow has nearly doubled, as the following figures will best illustrate :—

*Number and Register Tonnage of Steamers engaged in Traffic on the River Clyde during the Year ending June, 1852.*

	Number.	Tonnage.	Total.
Trading Steamers .....	39	8,643	8,682
Passenger do. ....	31	2,522	2,553
Tug do. ....	23	827	850
	93	11,992	12,085

From the foregoing table it appears that, in the course of seventeen years, the number of regularly employed steamboats has increased from 67 to 93, and the tonnage from 6,691 to 11,992. While this, no doubt, exhibits a great and growing progress of the steamboat traffic between Glasgow and the various places with which it thereby communicates, it gives no idea whatever of the extent and magnitude to which steamboat building and marine engine making have reached during these few years past. Previous to the last ten years, in fact, these branches of industry on the Clyde and elsewhere may be said to have been in their infancy, but no sooner was the problem of ocean steam-navigation solved, than a stimulus was given to the construction of steam vessels altogether extraordinary. The following tables, which have been constructed from returns made to me by the various ship-builders and engineers in Glasgow, Dumbarton, Greenock, and Port-Glasgow, will best illustrate the

*Extent of Steamboat Building and Marine Engine Making on the Clyde.***TABLE I.**—*Number of Steam-Vessels and Power of Marine Engines built or made at Glasgow and Neighbourhood from 1846 to 1852.*

Years.	Number of Vessels.						Tonnage.			Engines' Horse Power.			
	Wood.	Iron.	Total.	Paddle.	Screw.	Total.	Wood.	Iron.	Total.	Wood Hull.	Iron Hull.	Total.	Vessels not built on the Clyde.
1846...	...	11	11	11	...	11	...	5,717	5,717	...	2,490	2,490	800
1847...	...	11	11	11	...	11	...	6,152	6,152	...	2,650	2,650	...
1848...	...	13	13	10	3	13	...	4,464	4,464	2,810	2,081	4,891	580
1849...	...	16	16	13	3	16	...	9,799	9,799	...	2,756	2,756	120
1850...	...	16	16	9	7	16	...	7,255	7,255	1,660	2,237	3,897	180
1851...	...	20	20	11	9	20	...	14,321	14,321	...	4,299	4,299	140
1852...	1	35	36	15	21	36	200	22,783	22,933	2,140	6,026	8,166	3,400
Totals	1	122	123	80	43	123	200	70,441	70,641	6,610	22,539	29,149	4,720

From the foregoing table it appears that, during the last seven years, there have been constructed, or are now constructing, at Glasgow and its neighbourhood, 123 vessels, of which 1 was of wood, 122 of iron, 80 paddle and 43 screw; consisting of 200 wooden tonnage, 70,441 iron tonnage, 6,610 horse-power engines for wooden hulls, 22,539 horse-power engines for iron hulls, and 4,720 horse-power engines for vessels not built in the Clyde.

TABLE II.—*Number of Steam-Vessels and Power of Marine Engines built or made at Dumbarton from 1846 to 1852.\**

Years.	Number of Vessels.						Tonnage.			Engines' Horse Power.			
	Wood.	Iron.	Total.	Paddle.	Screw.	Total.	Wood.	Iron.	Total.	Wood Hull.	Iron Hull.	Total.	Vessels not built on the Clyde.
1846...	...	5	5	2	3	5	...	1,080	1,080	...	...	...	...
1847...	...	7	7	2	5	7	...	1,439	1,439	...	...	...	...
1848...	...	5	5	2	3	5	...	650	650	...	...	...	...
1849...	...	4	4	2	2	4	...	1,264	1,264	...	...	...	...
1850...	...	8	8	2	6	8	...	3,136	3,136	...	400	400	...
1851...	...	9	9	5	4	9	...	3,908	3,908	...	610	610	...
1852...	...	20	20	5	15	20	...	18,284	18,284	...	2,605	2,605	200
Totals	...	58	58	20	38	58	...	29,761	29,761	...	3,615	3,615	200

From the preceding table it appears that, during the last seven years, there have been constructed, or are now constructing, in Dumbarton, 58 vessels all of iron, 20 being for paddles and 38 for screws, and having a tonnage of 29,761; and that during the last three years 3,615 horse-power engines have been made there for iron hulls, and 200 horse-power engines for vessels not built on the Clyde.

TABLE III.—*Number of Steam-Vessels and Power of Marine Engines built or made at Greenock and Port-Glasgow from 1846 to 1852.†*

Years.	Number of Vessels.						Tonnage.			Engines' Horse Power.			
	Wood.	Iron.	Total.	Paddle.	Screw.	Total.	Wood.	Iron.	Total.	Wood Hull.	Iron Hull.	Total.	Vessels not built on the Clyde.
1846...	...	1	1	1	...	1	...	328	328	...	...	...	...
1847...	3	5	8	8	...	8	5,485	3,923	9,408	...	1,120	1,120	410
1848...	2	14	16	11	5	16	2,117	5,178	7,295	...	640	640	354
1849...	1	2	3	2	1	3	285	450	735	...	150	150	260
1850...	3	5	8	3	5	8	4,813	3,400	8,213	65	845	910	440
1851...	1	12	13	6	7	13	2,402	7,093	9,495	...	1,260	1,260	800
1852...	3	14	17	10	7	17	3,029	8,699	11,728	64	1,424	1,488	2,250
Totals	13	53	66	41	25	66	18,131	29,071	47,202	129	5,439	5,568	4,514

\* Previous to 1850, there were no marine engines made in Dumbarton. The engines for the vessels built there being furnished by the engineers of Glasgow or Greenock. Now that the making of machinery has fairly been started, there will be a considerable increase to the workmen employed.

† Since the returns were received, and the tables prepared, a large addition has been made to the steamboats and marine engines in progress of construction, particularly at Greenock and Port-Glasgow, and consequently affording wages to an additional number of workmen. This branch of industry is, in fact, making every day greater and greater strides.

From the foregoing table it appears that, during the last seven years, there have been constructed, or are now in progress of construction, at Greenock or Port-Glasgow, 66 steam vessels, of which 13 were of wood and 53 of iron, 41 paddles and 25 screws; consisting of 18,131 wood tonnage, and 29,071 iron tonnage, 129 horse-power engines for wooden hulls, 5,439 horse-power engines for iron hulls, and 4,514 horse-power engines for vessels not built on the Clyde.

TABLE IV—*Number of Steam-Vessels and Power of Marine Engines built or made at all the Ports on the Clyde from 1846 to 1852.*

Years.	Number of Vessels.						Tonnage.			Engines' Horse Power.			
	Wood.	Iron.	Total.	Paddle.	Screw.	Total.	Wood.	Iron.	Total.	Wood Hull.	Iron Hull.	Total.	Vessels not built on the Clyde.
1846...	...	17	17	14	3	17	...	7,125	7,125	...	2,490	2,490	300
1847...	3	23	26	21	5	26	5,485	11,514	16,999	...	3,770	3,770	410
1848...	2	32	34	23	11	34	2,117	10,292	12,409	2,810	2,721	5,531	934
1849...	1	22	23	17	6	23	285	11,513	11,798	...	2,906	2,906	380
1850...	3	29	32	14	18	32	4,813	13,791	18,604	1,725	3,482	5,207	620
1851...	1	41	42	22	20	42	2,402	25,322	27,724	...	6,169	6,169	940
1852...	4	69	73	30	43	73	3,229	49,716	52,945	2,204	10,055	12,259	5,850
Totals	14	233	247	141	106	247	18,331	129,273	147,604	6,739	31,593	38,332	9,434

On examining the foregoing table it will be found that, during the last seven years, the steam vessels built and the marine engines made, including those at present constructing, have been as follows:— Number of steam vessels built—wood hulls, 14; iron hulls, 233; in all, 247; of these 141 were paddles and 106 screws. The tonnage of the wooden steamers amounts to 18,331, of the iron to 129,273. The engines' horse-power in wood hulls was 6,739, the engines' horse-power in iron hulls was 31,593; while there was of engines' horse-power, constructed for vessels not built on the Clyde, 9,434; making a grand total of 247 steamers, amounting to 147,604 tons, and of engines 47,766 horses' power.

From these tables also may be gathered the fact, that wooden hulls for steamers are giving place to those of iron, and that the screw is more patronized than the paddle. Of the whole vessels constructed during 1852, or in progress of construction, at the various building-yards on the Clyde, amounting to 73, only 4 were of wood, while the proportion of screws to paddles is as 43 to 30.

Before leaving the present extent of the branch of industry under consideration, it may, perhaps, be as well to state that, in addition to the steamboats and marine engines constructed on the Clyde, there has been, and is at present, a large business carried on in steam dredgers and iron punts, not only for maintaining and extending the Clyde navigation itself, but also for improving other rivers and harbours. On the Clyde alone there are at present, in daily use, 5 dredging machines, 4 of these having one row of buckets, and the other two; the average

horse-power of the 4 is 20 each, and the average draught of water 4 feet 2 inches, capable of dredging to a depth of 18 feet, the cost being about 4,000*l.* each. The draught of the double bucket machine is 5 feet 1 inch, and can dredge to the depth of 22 feet; its cost was 8,000*l.* At this moment one engineering house in Glasgow is engaged in constructing a dredging machine of 20 horse-power for Riga, and another of similar power for Copenhagen. The advantages arising from the use of such machines may at once be appreciated when it is mentioned that in 1824, when the first steam dredger was set at work in the Clyde, the average depth of water at ordinary tides was scarcely 10 feet; whereas at present the average depth is above 17 feet.

Having now given some idea of the extent of steamboat building, &c., on the Clyde, let me next attempt to arrive at some probable idea of its value and importance as a branch of the business and industry of the district in which it is located. This, however, is a more difficult task than it would appear at first sight to be, arising from the great variety of circumstances which affect the price of different sizes and kinds of steamers, and particularly from the great difference occurring in what may be designated their general and cabin furnishings. As a proof of this I may mention that, of the 14 ocean steamers for the British and American Royal Mail Service, which were all built and fitted out in the Clyde, and which commenced at a cost for each ship of about 50,000*l.*, the last, from increased size and power, reaches upwards of 110,000*l.*, an increase of price far greater than the increase of power and tonnage. From all I can gather from those best conversant with the subject, I am inclined to assume, as an approximation to the truth, the following prices:—

Wooden hulls of all sizes, irrespective of the cost of engines, boilers, and machinery, and exclusive of all furnishings, 14*l.* per ton; iron hulls as above, 12*l.* per ton. The general and cabin furnishings, as I have already stated, are so various, according to the employment intended for, and style of finish, that no price per ton can be named as a general rule. It may be said to range from 6*l.* to even as high as 15*l.*, but I shall assume the average of all kinds to be 8*l.*\*

\* I have been furnished with the cost in detail of a vessel of 604 tons, and of 320 horse-power engine:—

Building hull .....	£7,852
Joiner's and Smith's account.....	1,953
Upholstery .....	754
Plumbers .....	318
Painter and Cabinet-maker .....	273
Sails, ropes, and rigging .....	354
Copper .....	363
Carving and gilding .....	907
Other accounts .....	563
	<hr/>
	13,337
320 horse-power engine at 42 <i>l.</i> .....	13,440
	<hr/>
	26,777
Silver plate, crystal, crockery, bed and table linen, and } Steward's department.....}	2,233
	<hr/>
	£29,000

The above shows that while the hull cost 13*l.* per ton, the furnishings cost 9*l.* per ton, and the plate, &c., 3*l.* per ton.

The cost of engines also varies greatly according to size, description of engine, and style of finish. Contracts will be taken at from 25*l.* to 50*l.* per horse-power. I shall assume 35*l.* as a fair average. Proceeding, then, upon this hypothesis, the value for the whole seven years will be as follows :—

Wooden hulls, tonnage	18,331	at £14	.....	£256,634
Iron do. do.	129,273	„ 12	.....	1,551,276
General furnishings, &c.	197,604	„ 8	.....	1,180,832
Marine engines	47,766	„ 35	.....	1,661,810
				<hr/>
				£4,650,552

Showing an annual average of £664,364.

If, however, we take only the two last years' completed work, and include in it what is now constructing, the annual average for these two years will be 1,253,636*l.*

While this certainly looks a large sum, it by no means fully exhibits the value of this branch of industry, for the above sum only represents new vessels and new machinery, and has no reference whatever either to the enlargement of vessels or to the ordinary and extraordinary repairs made on the old.

To show that the amount of steamboat repairs in the Clyde must be very considerable, I may state that, in the course of five years, one steam-ship which originally cost 29,000*l.*, paid 12,500*l.* for repairs, or upwards of 10 per cent. yearly of its value; and that another steam-ship during seven years, originally costing 37,000*l.*, paid 12,700*l.* for repairs. Of these repairs the carpenter got 9,526*l.*, the engineer 12,405*l.*, and sundry other parties 3,269*l.*

If, from the want of data, we only approximate the value of this industry, we can at least state the number of persons employed in the various building-yards and engine-shops connected with the construction and repair of steam-vessels on the Clyde. At present the number employed is as follows :—

Glasgow, &c.	6,210
Greenock and Port Glasgow	3,250
Dumbarton	1,360
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In all	10,820

Here, then, we have the fact that this branch of industry gives work and support to no less than 10,820 individuals; and when we consider the high wages given to many of the engineers, and the respectable rate of remuneration paid to even the lowest persons engaged in this business, it is perhaps not too much to assume that the average of the wages paid to all classes of men and boys will amount to at least 16*s.* per week, and, consequently, the trade circulates 8,656*l.* weekly, or 450,112*l.* annually, of wages.

Although these figures show an amount of labour and wages assuredly large, still they do not at all exhibit the whole of the labour and wages employed in the trade. In addition to the workmen enumerated as employed immediately by the ship-builders and engineers themselves, there are a vast number of others employed in the supplementary part of the business. For instance, it may be stated



that, with the exception perhaps of Mr. Robert Napier, almost all the other engineers in Glasgow and Dumbarton are dependent on other parties for castings of brass and iron, and especially for what are called heavy forgings; while all employ a large class of joiners, painters, carvers, gilders, upholsterers, sail-makers, &c., for finishing and decorating their vessels. Taking all into consideration, it is quite plain that this trade, although so new, is already one of the greatest importance to Scotland and the country at large, and from the rapid strides it is now making, it is destined to be one of the great sources of employment and wages in the west of Scotland.\*

Before closing this rather imperfect paper, perhaps I may be pardoned for stating that, amidst all the substantial benefits which are accruing to the country in general, and to the Clyde in particular, from the establishment of the great and industrial art whose rise, progress, and value we have just been considering, it is, at the same time, satisfactory to reflect that, in the progressive advancement of the steamboat may be seen far more important results than any of a merely economical or pecuniary nature. With the progress of steam navigation is, in fact, linked the progress of humanity in all that is useful, intellectual, and moral. By the power of this agent many of the prejudices, superstitions, and false opinions of the previously isolated families of the world have already been partially removed; and in its still further improvement and extension, we may safely calculate on increased blessings for the whole human race. Would it be too much to hope that, through the influence of this agent, we have one of the best and mightiest missionaries of intelligence, civilisation, and peace?

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\* The wages paid to these, say 3,500 to 4,000 persons, engaged in the supplementary part of the steamboat making and furnishing, may be fairly assumed to be little less than 4,000*l.* weekly, which, when added to the sum stated above, will show that the wages connected with this branch of industry will probably amount to from 12,000*l.* to 13,000*l.* per week. And when it is recollected that the whole cotton, woollen, flax, and silk factories of Lanarkshire, having 918,395 spindles and 18,811 power-looms, only employed, in 1850, 24,885 persons—of whom only 5,759 were males—we shall have a better idea of the importance of this great branch of industry to Glasgow and the other ports of the Clyde.